

## CLAIMS

## WHAT IS CLAIMED IS:

1. A door system for closing a doorway in a mine stopping, said door system comprising:

a door hinged adjacent the doorway for swinging relative to the stopping between a closed position and an open position swung outwardly away from the stopping;

a keeper mounted in fixed position relative to the doorway; and

a trigger-actuated latch mechanism including a detent engageable with the keeper for latching the door in its closed position and a trigger operably connected to the detent in a latched position, the mechanism being constructed and configured so that actuation of the trigger causes the detent to move from a latched position in which the detent engages the keeper for latching the door closed to an unlatched position in which the detent is disengaged from the keeper for allowing the door to be opened.

2. A door system as set forth in claim 1 wherein the latch mechanism includes a sear for holding the detent in the latched position and wherein actuation of the trigger causes release of the detent from the sear.

3. A door system as set forth in claim 2 wherein the detent is spring-biased to the unlatched position.

4. A door system as set forth in claim 1 wherein the latch mechanism is mounted on the door and comprises a quadrilateral linkage mounting the detent and adapted for maintaining the detent in the latched position even if the keeper moves relative to the door, as in a mine convergence.

5. A door system as set forth in claim 4 wherein the quadrilateral linkage includes a first pair of opposing spaced-apart links, a second pair of opposing spaced-apart links having pivot connections with said first pair of spaced-apart links, and a spring attached to the pivot connections at opposite corners of the linkage for maintaining the detent in the latched position.

6. A door system as set forth in claim 5 wherein the mechanism includes a sear for holding the detent in the latched position, the sear being pivotally connected to at least one of said spaced-apart links, and wherein actuation of the trigger causes pivotal movement of the sear for releasing the detent therefrom.

7. A door system as set forth in claim 6 wherein the detent is pivotally connected to at least one of the spaced-apart links and is biased to the unlatched position so that actuation of the trigger causes the detent to pivot to the unlatched position.

8. A door system as set forth in claim 7 wherein the detent and sear are sized and shaped so that the detent contacts the frame as the door is moved from the open position to the closed position for re-cocking the detent to a cocked position as the door is closed.

9. A door system as set forth in claim 8 wherein the detent is adapted to remain in the unlatched position after actuation of the trigger and prior to re-cocking to facilitate opening of the door against air pressure.

10. A door system as set forth in claim 8 wherein the sear includes a chamfer for facilitating re-cocking of the detent.

11. A door system as set forth in claim 8 wherein the trigger is spring-biased to facilitate re-cocking of the detent.

12. A door system as set forth in claim 1 wherein the trigger is located on an inward side of the door and wherein the mechanism further comprises a second trigger on an outward side of the door so that the mechanism is operable from both sides of the door.

13. A door system as set forth in claim 12 wherein the door includes an outward handle on its outward side, the mechanism being constructed and configured so that a user can actuate the second trigger and thereafter pull on the handle without the detent moving back to the latched position.

14. A door system for closing a doorway in a mine stopping, said door system comprising:

a door hinged adjacent the doorway for swinging relative to the stopping between a closed position and an open position swung outwardly away from the stopping;

a keeper mounted in fixed position relative to the doorway; and

a latch mechanism including a detent engageable with the keeper for latching the door in its closed position when the detent is in a latched, cocked position, a biasing member for biasing the detent to an unlatched, uncocked position, a sear for holding the detent in the cocked position, and a trigger operably connected to the sear for moving the sear away from the detent to thereby cause the detent to move from the latched, cocked position to the unlatched, uncocked position, the mechanism being constructed and configured so that upon actuation of the

trigger, the detent remains in the unlatched, uncocked position at least until the door is opened.

15. A method of using the door of claim 14 comprising the steps in sequence:

actuating the trigger to cause the detent to move to the unlatched, uncocked position;

5 releasing the trigger; and  
thereafter pulling the door to the open position.

16. A method of using the door of claim 15 further comprising closing the door after the door has been pulled open to re-cock the mechanism so that the detent is re-cocked and prepared for actuation.

17. A door system as set forth in claim 14 wherein the trigger is located on an inward side of the door and wherein the mechanism further comprises a second trigger on an outward side of the door so that the mechanism is operable from both sides of the door, and wherein the door includes an outward handle on its outward side.

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18. A method of opening the door of claim 17 including actuating the trigger to cause the detent to move to the unlatched, uncocked position, releasing the trigger and thereafter pulling on the outward handle to move the door to the open position.

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19. A door system for closing a doorway in a mine stopping, said door system comprising:

a door hinged adjacent the doorway for swinging relative to the stopping between a closed position and an open position swung outwardly away from the stopping;

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a keeper mounted in fixed position relative to the doorway; and

a trigger-actuated latch mechanism including a quadrilateral linkage mounted on the door, a detent on the linkage and engageable with the keeper for latching the door in its closed position, and a trigger bar having a sear for receiving the detent and holding the detent in the latched position,

wherein actuating the trigger causes the detent to move from a latched position in which the detent engages the keeper for latching the door closed to an unlatched position in which the detent is released from the sear for allowing the door to be opened.

20. A door system as set forth in claim 19 wherein the detent is pivotally connected to at least one of the spaced-apart links and is biased to the unlatched position so that actuation of the trigger causes the detent to rotate to the unlatched position.

21. A door system as set forth in claim 19 wherein the quadrilateral linkage includes a first pair of opposing spaced-apart links, a second pair of opposing spaced-apart links having pivot connections with said first pair of spaced-apart links, and a spring attached to the pivot connections at opposite corners of the linkage for maintaining the detent in the latched position.

22. A door system as set forth in claim 19 wherein the detent is cocked when in the latched position, is movable to an uncocked position for moving the door to the open position and is movable to an unlatched, cocked position when the door is moved from the open position to the closed position.

23. A door system as set forth in claim 22 wherein the detent and the sear are constructed and configured so that

the detent contacts the frame as the door is moved to the closed position for re-cocking the detent to a cocked position in the sear as the door is closed.

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24. A door system as set forth in claim 23 wherein the detent is biased to the unlatched position and the trigger bar is biased toward the detent so that the sear is forced toward the detent to facilitate re-cocking of the detent.

25. A door system as set forth in claim 24 wherein the detent remains in the unlatched position after actuation of the trigger without continued force against the trigger to facilitate opening of the door against air pressure.

26. A door system as set forth in claim 24 wherein the sear includes a chamfer for facilitating re-cocking of the detent.

27. A door system as set forth in claim 19 wherein the trigger extends through the door such that the trigger is operable from both sides of the door.